NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

CROP BY-PRODUCT TRANSFER

INTERIM STANDARD

(No.)

Code 736

DEFINITION

A crop by-product conveyance system using structures, conduits, or equipment.

PURPOSE

To transfer crop by-products (i.e.; pulp, twigs, leaves, process and wash water, and other residues associated with crop harvesting, handling or processing may be included) through a hopper or reception pit, a pump (if applicable), and a conduit to:

A crop by-product storage/treatment facility:

- A loading area.
- To agricultural land for final utilization. This includes application of crop by-products to the utilization area.

CONDITION WHERE PRACTICE APPLIES

The crop by-products transfer component is a part of a planned agricultural waste management system.

Where crop by-product is generated by crop harvesting, handling, production or processing; and a conveyance system is necessary to transfer by-products from the source to a storage/treatment facility and/or a loading area, and/or from storage/treatment to a safe area and proper utilization.

CRITERIA

Criteria for all purposes

Crop by-products transfer components shall comply with all federal, state, and local laws, rules and regulations.

Structures - All structures, including those which provide a work area around pumps, will be designed to withstand the anticipated static and dynamic loading. The structure shall withstand earth and hydrostatic loading in accordance with Conservation Practice Standard Waste Storage Facility (313). The minimum thickness of component elements of concrete structures shall also be in accordance with Conservation Practice Standard 313. When needed, covers shall be designed to support the anticipated dead and live loads.

Structures to receive crop by-product shall be constructed as designed.

Infiltration Ditches – Design of infiltration ditches shall be in accordance with Interim Conservation Practice Standard Infiltration Ditch (753).

This practice should only be used for small operations where installation of other practices is limited by topography or farm size. Do not use infiltration ditches by themselves when the farm operation exceeds the limits of the standard.

When curbs are needed in conjunction with structures, they shall be constructed of either concrete or wood. Curbs shall be of sufficient height to insure total crop by-product flow into the structure and be adequately anchored.

Pipelines – Design of pipelines shall be in accordance with Conservation Practice Standard Irrigation Water Conveyance (430). The minimum pipeline capacity from collection facilities to storage/treatment facilities shall be the maximum flow anticipated on a daily basis. The minimum pipeline capacity from storage/treatment facilities to utilization areas shall insure the storage/treatment facilities can be emptied within the time limits stated in the management plan for crop by-product utilization. Pipelines shall be designed to have a minimum of 2 feet per second and a minimum of 6 feet per second velocity except where by-products are transferred in a gravity system; in which case velocities can be reduced if a minimum of 5 feet of head is provided on the pipe system.

Clean-out access shall be provided for gravity pipelines at a maximum interval of 200 feet for lines carrying non-bedded by-products. For pipelines carrying bedded by-products the maximum interval shall be 150 feet. Gravity pipelines shall not have horizontal curves or bends except minor deflections (less than 10 degrees) in the pipe joints unless special design considerations are used.

Other Conduits shall be designed in accordance with Conservation Practice Standards Irrigation Water Conveyance, Ditch and Canal Lining Plain Concrete (428A), Irrigation Water Conveyance, Ditch and Canal Lining Flexible Membrane (428B), Irrigation Water Conveyance, Ditch and Canal Lining Galvanized Steel (428C).

Pumps - Pumps installed for by-product transfer shall meet the requirements of Conservation Practice Standard Pumping Plant for Water Control (533). Pumps shall be sized to transfer by-products at required system head and volume. Type of pump shall be based on the consistency of by-products. Consideration for pump installations shall be based on manufacturer's recommendations.

Safety – The system shall consider the safety of humans and animals during construction, operation and maintenance. Open structures shall be provided with covers or barriers such as gates, fences, and others. Ventilation and warning signs shall be provided for crop by-product transfer as necessary to warn of the danger of entry and reduce the risk of explosion, poisoning, or asphyxiation.

Pipelines from enclosed buildings shall be provided with a water-sealed trap and vent or similar devices where necessary to control gas into buildings.

Gravity discharge pipes used for emptying a storage/treatment facility shall have a minimum of two gates or valves, one of which shall be manually operated.

Tractors or other vehicles used to tow by-products spreaders or wagons shall be sized to reduce the danger or roll-over.

Criteria in support of the purpose of land application

Crop by-product shall be applied to the utilization area in amounts and at a time consistent with the crop by-product plan and Conservation Practice Standard Waste Utilization (633).

By-product spreaders and/or wagons shall have adequate capacity to insure the emptying of storage/treatment facilities within appropriate time periods as stated in the system operation and maintenance plan.

Gated pipe and other appurtenances used in conjunction with gravity application shall be designed to insure uniform application amounts.

CONSIDERATIONS

Utilization of topography to generate head to reduce pumping requirements.

Economics (including design life), overall by-product management system plans, and health and safety factors.

Possible contamination of domestic water systems and ground water.

Loading and unloading of equipment in the vicinity of the by-product transfer components.

Subsurface conditions, i.e.; depth to bedrock, water table, etc.

When applicable, compatibility to joint use of by-product transfer with irrigation system design requirements.

System for flushing pipelines with clean water.

Provisions for cleaning out solids deposition in ditches.

Pipe pressure rating adjustments required based on crop by-product temperature.

Corrosion resistance and water tightness in the selection of pipe material and joints.

Need for appropriate check valves, anti-siphon protection and open air breaks.

Sanitation needs of all conveyance equipment that leaves the farm in order to prevent the spread of disease and other pests.

Potential for mucilaginous deposits in smaller diameter pipe.

PLANS AND SPECIFICATIONS

Plans and specifications for installing crop by-product transfer systems shall be in accordance with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

OPERATION AND MAINTENANCE

Operation and maintenance shall be in accordance with the requirements specified in the overall operation and maintenance plan required by the applicable Conservation Practice Standard Waste Storage Facility (313), or Interim Conservation Practice Standard Infiltration Ditch (753).